

## AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph beginning at line 1 on page 9 as follows:

It is the difference in currents between transistors 106 and 107 that produces the stable band-gap voltage. ~~Assume that the current~~. If  $I_{106}$  is the current through transistor 106, that same current is through transistor 101 and resistor 104. In that case by Ohm's law,  $I_{106}$  times  $R_{104}$  equals the base-emitter voltage of transistor 102 minus the base-emitter voltage of transistor 101, i.e.:

$$I_{106} \cdot R_{104} = V_{BE102} - V_{BE101}$$

then

$$I_{106} \cdot R_{104} = (V_T \ln m)/R_{104}$$

where:  $m$  is the relationship between transistor 101 and transistor 102 and  $m$  is larger than unity which means that transistor 101 is "bigger" than transistor 102. This in turn means that, for the same base-emitter voltage and the same emitter-collector voltage, transistor 101 will pass  $m$  times as much current as transistor 102.

Please amend the paragraphs starting at line 1 on page 11 as follows:

To overcome this, a buffer can be added to the band-gap circuit as is shown in Figure 2. In essence the same circuit as in Figure 1, the circuitry associated with transistors 201 through 207 and resistors 211 and 212 provides the same functionality as the circuitry in Figure 1. The current source shown at 214 is implemented in this illustration as a MOSFET current source. PNP transistors 203 and 204 share a common base which is shunted to the collector of transistor 203. NPN transistors 201 and 202 also share a common base that connects  $V_{BG}$ , the band-gap voltage at 200. Transistor 205 has a base connected to the common collectors of transistors 202 and 204. The collector of transistor 205 is connected to the drain of transistor 206 which shares a common gate with transistor 207. The common gate of transistors 206 and

207 is shunted to the drain-collector connection between transistors 205 and 206. In the implementation illustrated in Figure 2,  $m$  symbolizes the relationship in current flow between transistor 201 and transistor 202. Because their bases are common, the ratio of current flows is constant. The base-emitter voltage of transistor 201 and transistor 202 differs by the voltage across resistor 211.

The circuit in Figure 2 differs primarily from that in Figure 1 in the employment of transistor 209. Transistor 209 is implemented as an NPN bipolar device, which typically have significantly lower impedances than FETs. Transistor 209 is connected at its base to common emitters of transistors 203, 204 and 205 and with its collector connected to  $V_{cc}$ . This causes transistor 209 to behave as an emitter follower and function functions as a buffer. It is well known in the art that an emitter follower can accept a signal at a high resistance level without significant attenuation and  $[[a]]$  reproduce it at a low resistance level and with no phase shift. Therefore, in this implementation, it functions well as a buffer. However, a problem that arises in the use of a buffer is the requirement for a higher supply voltage,  $V_{cc}$ , in order to preserve a constant band-gap voltage.